

trol is poor and the lack of emotional response makes these techniques less than ideal.

Microneurovascular surgery has spawned the most promising procedures. Cross-face microneural grafting to bring voluntary and involuntary input from the contralateral facial nerve can reanimate existing facial muscles if done within the first six months, or can be used to innervate free vascularized muscle transfers.

A two-stage procedure using a cross-facial-sural nerve graft from the normal to the abnormal side, followed in six to eight months by a free microneurovascular transfer of an appropriate muscle to the previously placed nerve graft and local vessels, has a high success rate—80% to 90%. Some reports have shown that almost half the patients regain some degree of independent control of the reanimated side. The ideal choice for motor unit is not resolved, but the gracilis (whole or in part) or the pectoralis minor produced the best results.

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REFERENCES

- Buncke HJ, Furnas DW (Eds): Symposium on Clinical Frontiers in Reconstructive Microsurgery—Vol 24. St Louis, CV Mosby, 1984, pp 151-187
Harrison DH: The pectoralis minor vascularized muscle graft for the treatment of unilateral facial palsy. *Plast Reconstr Surg* 1985 Feb; 75:206-216
Manktelow RT, Zuker RM: Muscle transplantation by fascicular territory. *Plast Reconstr Surg* 1984; 73:751-757

Plastic Surgery for Nonwhites

THE DESIRE for aesthetic facial surgical procedures by non-white patients is increasing. Factors influencing this increase range from wishing to look less like a perceived ethnic prototype to the desire to resemble a star from the entertainment world.

By and large, Asian patients seek alteration of their eyelids and nose. Those of African and Malaysian background more often request a smaller nasal configuration.

The change in appearance from the hooded upper eyelid to a well-defined fold is often striking. Additionally, female patients report that applying eyelid makeup is easier. Methods vary but generally include surgical fixation of loose dermis to the underlying levator apparatus, establishing a new eyelid fold 6 to 9 mm superior to the eyelash margins.

Changes in nasal appearance usually involve elevating the nasal dorsum (profile), narrowing the alar bases (frontal) and providing a thinner, more defined nasal tip. Various alloplastic materials are currently in vogue for dorsal elevation, but these carry the risks of extrusion and displacement. Autogenous cartilage and bone grafts are more difficult to use but are more stable.

The methods used in nasal operations are not new, but are based on proven maneuvers—fitting the operation to the patient. As in all surgical procedures, careful patient selection, discussion of realistic expectations and skillful preoperative planning are essential.

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REFERENCES

- Falces E, Wesser D, Gorney M: Cosmetic surgery for the non-Caucasian nose. *Plast Reconstr Surg* 1970 Apr; 45:317-325
Hin LC: Oriental blepharoplasty: A critical review of techniques and potential hazards. *Ann Plast Surg* 1981 Nov; 7:362-374

Matory WE, Falces E: Non-Caucasian rhinoplasty: A 16 year experience. *Plast Reconstr Surg* 1986 Feb; 77:239-251

Keloid and Hypertrophic Scar

PENETRATING WOUNDS of the skin elicit a cascade of biologic and biochemical events including inflammation and a fibroproliferative response that results in the deposition of collagen, noncollagenous proteins and proteoglycans. Scar tissue is the end product. The quality of a scar is directly related to the efficiency of the regulation of collagen production during wound healing and, specifically, the balance between new collagen synthesis and collagen degradation during the later stages of the process. Under certain circumstances, the equilibrium between collagen anabolism and catabolism is imbalanced, resulting in overproduction of collagen. In the extreme, hypertrophic scar or keloid may result.

The biologic differences between hypertrophic scar and keloid have yet to be completely characterized. Traditionally, hypertrophic scar has been classified as exuberant scar production within the boundaries of the original wound. A scar that overgrows and spreads beyond the borders of the original wound is called a keloid.

Biochemical and morphologic studies of the fibrillar collagen ultrastructure, the nature of chemical cross-linking of collagen molecules and the cell types inhabiting keloid and hypertrophic scar were conducted by Knapp and co-workers. They found that collagen fibers and fiber bundles showed an inverse correlation between degree of organization and scar abnormality. In addition, the collagen in skin and mature scars was highly cross-linked while that of hypertrophic scar and keloid was progressively less so. Three types of fibroblast seemed to populate the scars, with their relative distribution varying among the scar types. They concluded that hypertrophic scar and keloid are not distinct pathologic processes but, instead, represent progressively more aberrant activity in the continuum of the wound healing response.

Other evidence suggests that keloid fibroblasts produce significantly more collagen per cell than do fibroblasts derived from normal skin and normal scar. It may be that keloid fibroblasts have lost the ability to respond to feedback inhibitory signals that normally regulate wound healing.

Among other elements in the production of hypertrophic scar and keloid, variation encountered in the microvascular regeneration of the wound bed with low oxygen and high carbon dioxide levels has been implicated as a factor in promoting excessive collagen deposition and scar. Others have shown that the extracellular matrix of the wound exerts a powerful effect on the biosynthetic activity of cells; a hypertrophic scar or keloid could develop as a result of abnormal turnover of the wound matrix during the healing process.

The traditional treatment of hypertrophic scar and keloid has involved five general approaches: surgical procedures, pressure, irradiation, corticosteroids and other drugs. Currently, intralesional injection of triamcinolone acetonide alone or in combination with surgical correction appears to be the most popular means of dealing with these scars. The precise mechanism by which corticosteroids influence an abnormal scar is not known. It may be that the steroids influence collagen synthesis in scars by enhancing catabolic aspects of

turnover. This may occur by removal of collagenase inhibitors or by promotion of the activity of collagenase present in the scar tissue.

Recently, the use of the neodymium-yttrium-aluminum-garnet laser has been explored in the treatment of keloid, and early clinical results are promising. The mechanism of action of laser irradiation to reduce keloid scarring appears to be associated with fibroblast inhibition. The influence of the laser on the integrity of fibrillar collagen also must not be discounted and is the subject of ongoing investigation.

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REFERENCES

- Abergel RP, Dwyer RM, Meeker CA, et al: Laser treatment of keloids: A clinical trial and an *in vitro* study with Nd:YAG laser. *Lasers Surg Med* 1984; 4:291-295
- Chvapil M, Koopman CF Jr: Scar formation: Physiology and pathological states. *Otolaryngol Clin North Am* 1984 May; 17:265-272
- Cohen IK, Diegelman RF: The biology of keloid and hypertrophic scar and the influence of corticosteroids. *Clin Plast Surg* 1977 Apr; 4:297-299
- Kischer CW, Shetlar MR, Chvapil M: Hypertrophic scars and keloids: A review and new concept concerning their origin. *Scanning Electron Microscopy* 1982; 4:1699-1713
- Knapp TR, Daniels RJ, Kaplan EN: Pathologic scar formation—Morphologic and biochemical correlates. *Am J Pathol* 1977; 86:47-69

Immediate Breast Reconstruction

IMMEDIATE RECONSTRUCTION of the breast, done during the same operation as the ablative procedure, is being practiced more and more frequently. There are several factors responsible for this increase. Previously it was thought that immediate reconstruction might adversely affect the course of the disease following ablation. This concern now appears to be unwarranted. It was previously postulated that patients needed to have a period of mourning for the loss of a breast before reconstruction was attempted. This was based on the idea that acceptance of the reconstructed breast would be easier if a patient first went through this period of mourning. With the newer techniques now available, this is no longer necessary. Immediate reconstruction also eliminates the cost and anesthetic risk of a second procedure, a factor that has stimulated patient compliance. Current modern techniques of breast reconstruction have greatly improved the final cosmetic result and thus patient acceptance. Cooperation between plastic surgeon and general surgeon has led to improved pre-operative markings and incision planning. This cooperation has helped to maintain medial breast skin whenever possible, thereby reducing medial scarring and making it increasingly easier to create unscarred visible cleavage. Similarly, correct planning is less likely to destroy the normal inframammary fold, a finding that has greatly improved the final cosmetic result.

Four methods are available today for immediate breast reconstruction. The method chosen is largely dictated by surgeon and patient preference and the amount of tissue available following the ablative operation.

- If the skin flaps left behind are thick enough, ample and viable, breast reconstruction may be easily achieved by the submuscular placement of an appropriately sized prosthesis. Nipple reconstruction and possibly a reconstructive procedure on the opposite breast to reduce any size discrepancies are evaluated after three months as a second procedure.
- If there is not enough skin available, though the existing flaps may be of adequate thickness, a two-stage procedure

using a tissue expander may be used. The tissue expander is inserted and the wound allowed to heal. The expander is then gradually inflated percutaneously, over a period of weeks or months, until its volume is greater than that of the prosthesis to be inserted during the second procedure. Much like the expansion of the abdomen during pregnancy, this slow distension of the chest wall skin will allow sufficient laxity or stretch of the skin to accommodate a prosthesis used to reconstruct the missing breast. A tissue expander has now been developed that, once inflated to the appropriate size, is simply left in position as a prosthesis, eliminating the necessity for a second procedure other than that required for reconstruction of the nipple.

- Rapidly gaining far greater acceptance and popularity is the use of the transverse rectus abdominis myocutaneous (TRAM) flap, using the skin below or around the umbilicus to replace the breast tissue removed. An added bonus is the abdominal lipectomy or so-called tummy-tuck procedure done at the same time. The plastic surgeon can elevate the flap at the same time that the general surgeon does the ablative procedure. With this technique, the overall duration of the operation is greatly reduced. The natural feel and more natural appearance have made this method the choice of many.

- When conditions such as previous abdominal scarring or other factors make this impossible, surgeons may opt to use the latissimus dorsi myocutaneous flap with a prosthesis.

In summary, immediate breast reconstruction is rapidly gaining greater acceptance, and current techniques, including the use of the TRAM flap, have improved the feel and look of the final result while not adversely affecting the ablative procedure or postoperative management of patients.

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REFERENCE

- Scheffan M (Ed): *Advances in Breast Reconstruction*. Clin Plast Surg, 1984 Apr, vol 11

Immediate Treatment of Superficial Burns

LOCAL COOLING limits edema and prevents progressive thrombosis of the dermal capillaries that normally occur during the first few hours following burn injury. This can only be used either for burns of less than 5% of the body surface area or for selected areas, such as the face or hands. Applying cold (not freezing) water by immersion or covering with wet towels for 30 minutes has been beneficial even when started half an hour after the injury.

Following cooling, the injured part should be gently washed with soap and water to remove external dirt and contamination. Hair in and around the burn wound is shaved to prevent its entrapment in wound secretions. Broken blisters and loose skin are debrided by scissors excision. At this point the depth of the wound is assessed. The typical characteristics of the superficial partial thickness wound can be found: pain, blanching and capillary refill of the moist pink wound surface. Deeper and larger injuries will frequently require surgical consultation or referral to a burn center, but most smaller superficial injuries can be treated in an emergency department or a physician's office.

Antibiotics are not routinely prescribed to a healthy patient. Topical antibacterial creams, which require frequent dressing changes and cause pain and discomfort, are not